

UNIVERSAL AIR NOZZLE ADAPTER

BACKGROUND OF THE INVENTION

1. Field of the Invention

5 The present invention relates to aerators, and more particularly, to a universal air nozzle adapter, which is connectable to any of a variety of air nozzles.

2. Description of the Related Art

Conventionally, an air nozzle connector is adapted to receive one single type of air nozzle, for example, a US type air nozzle connector is connectable to a US type
10 air nozzle only, and a French type air nozzle connector is connectable to a French type air nozzle only. In order to improve the problem of single use and to extend the applicability, a dual-usage air nozzle adapter is developed. A dual-usage air nozzle adapter is applicable to two different types of air nozzles, like US type air nozzle and French type air nozzle. However, because regular air nozzles are of diverse types, the
15 dual-usage air nozzle adapter may not be applicable in some cases. Therefore, different air nozzle connectors and/or adapters may have to be prepared to fit different air nozzles, causing inconvenience for the user.

Therefore, it is desirable to provide a universal air nozzle adapter that eliminates the aforesaid drawbacks.

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SUMMARY OF THE INVENTION

The present invention has been accomplished under the circumstances in view. It is one object of the present invention to provide an air nozzle adapter, which is compatible with US type air nozzle as well as UK type air nozzle. It is another object
25 of the present invention to provide an air nozzle adapter, which can be installed with

different air nozzle connectors for connection with different types of air nozzles.

To achieve foregoing objects of the present invention, the universal air nozzle adapter of the present invention is comprised of a casing, a block member, and a clamping member. The casing includes a head and a body extended from a side of the head, the head having a first coupling hole for receiving a US type air nozzle and a second coupling hole for receiving a UK type air nozzle, the body having an air inlet. The block member is mounted inside the head of the casing, having a first air hole and a second air hole both communicating with the air inlet. A packing member is mounted inside the block member and between the first air hole and the first coupling hole. A gasket is mounted between the second coupling hole and the second air hole. The clamping member is mounted at a side of the body of the casing, having a clamping tip corresponding to the second coupling hole and the second air hole. A spring member is provided between the clamping member and the body of the casing for keeping the clamping tip contacting against the casing.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective front view of a universal air nozzle adapter according to the present invention.

FIG. 2 is a perspective rear view of the universal air nozzle adapter according to the present invention.

FIG. 3 is a sectional view taken along line 3-3 indicated in FIG. 1.

FIG. 4 is similar to FIG. 3, showing that a locking lever is turned to a locking position.

FIG. 5 is a sectional view of the universal air nozzle adapter of the present invention connected with a US type air nozzle for operation.

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FIG. 6 is another sectional view of the universal air nozzle adapter of the present invention connected to the US type air nozzle for operation.

DETAILED DESCRIPTION OF THE INVENTION

5 Referring to FIGS. 1-3, a universal air nozzle adapter in accordance with the present invention is comprised of a casing **10**, a block member **20**, a clamping member **30**, a locking lever **40**, and a switching valve **50**,

The casing **10** includes a head **11** and a body **12** extended from a side of the head **11**. The body **12** has an air inlet **121** inside for communication with an inside of
10 the head **11**. The body **12** can be directly connected with an aerator or an air tube of the aerator to enable the air inlet **121** to communication with the aerator. The head **11** includes a first coupling hole **111** for receiving a US type air nozzle, and a second coupling hole **112** for receiving a UK type air nozzle.

The block member **20** is movably mounted inside the head **11** of the casing
15 **10**, including a first air hole **21** and a second air hole **22** respectively connected to the first coupling hole **111** and second coupling hole **112** of the head **11** of the casing **10**. Further, the first air hole **21** and the second air hole **22** communicate with the air inlet **121** of the casing **10**. The block member **20** is provided with a seal ring **201** to prevent the air passing through the air inlet **121** and the air outlets **21** and **22** from leaking out
20 of the head **11**. A packing ring **13** is mounted between the first air hole **21** and the first coupling hole **111** and is deformable to hold a US type air nozzle tight in the first coupling hole **111**. A gasket **14** is mounted between the second air hole **22** and the second coupling hole **112** to prevent the air passing through the second coupling hole **112** and a UK type air nozzle from leaking out of the second coupling hole **112**.

25 The clamping member **30** is pivotally mounted at a side of the body **12** of the

casing 10, having a clamping tip 31 at an end thereof and a finger strip 32 at the other end thereof. A spring member 33 is mounted between the body 12 of the casing 10 and the clamping member 30 for generating resilience to force the clamping tip 31 to tightly contact against the gasket 14 when the air nozzle adapter is connected with a UK type air nozzle. When the finger strip 31 is pressed, the UK type air nozzle can be moved away from the second coupling hole 112.

The locking lever 40, as shown in FIG. 3, is pivotally mounted at a side of the head 11, having an end contacting against the block member 20, as shown in FIG. 4. When the locking lever 40 is turned to a locking position, the locking lever 40 pushes the block member 20 forwards to force the block member 20 against the packing ring 13, thereby causing the packing ring 13 to deform to hold an air nozzle tight.

The switching valve 50 is mounted in the block member 20 for switching either connection between the air inlet 121 and the first air hole 21 or connection between the air inlet 121 and the second air hole 22. The switching valve 50 includes a valve chamber 51, two air passages 52 and 53 extended from the valve chamber 51 and respectively connected to the air holes 21 and 22, a guide hole 54 connecting the air passages 52 and 53 to the air inlet 121, and a valve ball 55 movably mounted in the valve chamber 51 for blocking the air passages 52 and 53. The air passages 52 and 53 each have a respective smoothly circularly arched orifice (not shown) for accommodating the valve ball 55. Further, the block member 20 has a recessed portion 15 at a side thereof. The recessed portion 15 is smoothly curved inwards, having two opposite lateral sides respectively disposed in communication with the guide hole 54 and the first air hole 21, and a bottom side disposed in communication with the second air hole 22. A smoothly arched cover plate 16 is provided inside the casing 10 and covered on a top side of the recessed portion 15, defining the aforesaid valve chamber

51. The air passage 52 extends through a top side of the smoothly arched cover plate 16. A seal ring 161 is fastened to the cover plate 16 to seal the valve chamber 51.

When connecting the first air hole 21 to a US type air nozzle 90, as shown in FIG. 5, the locking lever 40 is turned to the locking position to lock the US type air nozzle 90 to the head 11, and then the casing 10 is connected to an aerator 91. In the meantime, when compressed air is pumped from the aerator 91 to the nozzle adapter, the compressed air sequentially passes through the air inlet 121, the guide hole 54, the valve chamber 51 and the air passage 53 into the second air hole 22 where the pressure is relatively lower. Referring FIG. 6, when the air is continuously supplied, the valve ball 55 is sucked by the suction force of the air flow to be moved to the orifice of the air passage 53, thereby blocking the connection between the valve chamber 51 and the air passage 53, and therefore the supplied air is forced to pass from the air inlet 121 through the guide hole 54, the valve chamber 51, the air passage 52 and then into the first air hole 21 and the US type air nozzle 90. According to the present preferred embodiment, the switching action is achieved automatically. However, the switching action is not limited to the use of the aforesaid switching valve. Any suitable manual or automatic switching mechanism may be alternatively used for the aforesaid switching valve 50.

The invention further comprises at least one valve connector detachably installed on the casing 10. According to the present preferred embodiment, the body 12 of the casing 10 includes two mounting slots 122 recessed at two sides thereof. A needle type air nozzle connector 61 and a cone tip type air nozzle connector 62 are respectively detachably mounted to the mounting slots 122. The needle type air nozzle connector 61 has an end connectable to the first coupling hole 111 and the packing member 13, and the other end connectable to an air valve of an inflatable ball or the

like. The cone tip type air nozzle connector 62 has an end connectable to the first coupling hole 111 and the packing member 13, and the other end connectable to an air valve of a life buoy or the like. The locking lever 40 has a mounting slot 41 running therethrough. A French type air nozzle connector 63 is detachably mounted to the mounting slot 41. The French type air nozzle connector 63 has an end connectable to the first coupling hole 111 and the packing member 13, and the other end connectable to a French type air nozzle

As stated above, the first air hole and the first coupling hole of the universal air nozzle adapter, except receiving a US type air nozzle, can be connected with the French type air nozzle connector, the needle type air nozzle connector, or the cone tip type air nozzle connector for connection with any of a variety of air nozzles. Further, the second air hole and the second coupling hole are adapted for connecting to the UK type air nozzle. Therefore, the universal air nozzle adapter of the present invention is compatible with any of a variety of regular air nozzles.